REMARKS

Claims 1-17, 19-36 and 39 are pending. Claims 1-13 stand withdrawn from consideration. By this Amendment, Claims 18, 37 and 38 are canceled, and Claims 14, 16, 17, 27 and 34 are amended. Reconsideration of the January 27, 2003 Official Action is respectfully requested.

It is gratefully acknowledged that Claims 23 and 24 have been allowed.

The Office Action Summary (PTO-326) provided with the Official Action indicates that Claim 30 was rejected. However, Claim 30 was not included in any ground of rejection set forth in the Official Action. As Claim 30 depends ultimately from Claim 14, it is respectfully submitted that Claim 30 is patentable for at least the reasons stated below that Claim 14 is patentable.

Claim 27 was rejected under 35 U.S.C. § 112, second paragraph. The reasons for the rejection are stated at numbered paragraph 2 of the Official Action. The rejection is respectfully traversed.

Claim 27, as amended, recites "a substrate" to provide strict antecedent basis. Withdrawal of the rejection is respectfully requested.

Claims 14, 15, 19, 20, 26 and 34 were rejected under 35 U.S.C. § 102(b) over EP0845545 to Ding et al. ("Ding"). The reasons for the rejection are stated at numbered paragraphs 5-10 of the Official Action. The rejection is respectfully traversed.

Claim 14, as amended, includes the features of Claim 18 (now canceled), which was not rejected under this ground of rejection. Accordingly, the subject matter of amended

Claim 14 is patentable over Ding. Claims 15, 19, 20 and 26 depend from Claim 14 and, thus, also are patentable over Ding for at least the same reasons as those for Claim 14.

Claim 34 has been amended to include the features of Claims 37 and 38 (now canceled), which were not rejected under this ground of rejection. Accordingly, the subject matter of amended Claim 34 is patentable over Ding.

Therefore, withdrawal of the rejection is respectfully requested.

Claims 14-21, 25-29 and 31-39[1] were rejected under 35 U.S.C. § 103(a) over U.S. Patent No. 5,916,454 to Richardson et al. ("Richardson") in view of Ding. The reasons for the rejection are stated at numbered paragraphs 13-35 of the Official Action. Claims 18, 37 and 38 have been canceled. The rejection is respectfully traversed with respect to Claims 14-17, 19-21, 25-29, 31-36 and 39.

Claim 14, as amended, recites "a component of a plasma reactor, the component being selected from the group consisting of a plasma confinement ring, a focus ring, a pedestal, a chamber wall, a chamber liner and a gas distribution plate, the component having one or more surfaces exposed to the plasma during processing, the component comprising an as-sprayed plasma sprayed coating on a plasma exposed surface of the

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[1]During a February 3, 2003 telephone conference, Examiner Uhlir informed Applicants' undersigned representative that Claims 35-39 were rejected under this ground of rejection for the reasons stated at numbered paragraph 35 of the Official Action.

Additionally, Claim 33 was not included in the group of claims rejected under this ground of rejection stated at numbered paragraph 12. However, reasons for the rejection of Claim 33 are stated at numbered paragraph 31. Accordingly, for purposes of this response, Applicants have assumed that Claim 33 was also rejected under this ground of rejection.

component, the coating having an as-sprayed surface roughness that promotes the adhesion of polymer deposits" (emphasis added).

The Official Action acknowledges that Richardson fails to teach a coating for a plasma chamber part, which has an as-sprayed surface roughness that promotes the adhesion of polymer deposits, as recited in Claim 14.

However, the Official Action asserts that Ding teaches plasma sprayed coatings for plasma chamber parts that increase the adhesion of particles deposited on its surface. It is further asserted that Ding teaches applying the coatings to chamber parts that have been previously roughened improves the adhesion of the coatings to the chamber parts. The Official Action also asserts that the coating is conformally applied to the rough surface in Ding. It is further asserted that it would have been obvious to one having ordinary skill in the art to coat the rough plasma chamber parts disclosed by Richardson with the coatings disclosed by Ding. Applicants respectfully disagree with these assertions for the following reasons.

As acknowledged in the Official Action, Richardson not only fails to suggest forming an as-sprayed plasma sprayed coating on a plasma exposed surface of a component, such that the coating has an as-sprayed surface roughness that promotes the adhesion of polymer deposits, but fails to suggest the formation of any coating on a component of a plasma reactor. Rather, Richardson discloses providing roughened surfaces of chamber interior parts. For example, the roughened surfaces can be achieved by bead blasting (col. 6, lines 7-12). Richardson discloses that by providing such roughened surfaces, deposited byproduct film adhesion is enhanced on the roughened surfaces, as

compared to interior surfaces having smooth surfaces. Richardson further discloses that, consequently, less byproduct particles are flaked off from the roughened interior surfaces within the chamber (col. 5, lines 30-47). However, Richardson does not suggest that such byproduct particle generation could be reduced by alternatively forming coatings on the interior surfaces.

Ding discloses the formation of a coating 33 on a screening device 15 (see Fig. 3). Ding discloses that the coating promotes adhesion between the coating and depositing particles that impact the coating (col. 3, lines 16-20). Ding discloses that the coating may be applied via conventional methods, such as flame spraying, arc spraying, plasma spraying, etc. (col. 5, lines 45-49). Ding further discloses that the coating preferably comprises the same material as the target material, which is used for sputtering in the chamber (col. 5, lines 51-56). Sputtered material from the target adheres to the coating.

Ding discloses that the screening device surface 39 can be roughened via bead blasting prior to application of the coating 33 to provide increased adhesion between the particle screening device and the coating. However, Ding does not suggest that the roughened surface 39 could promote adhesion between the roughened surface and the depositing particles. Otherwise, there would be no reason for Ding to form the coating on the roughened surface. Ding clearly does not suggest forming the coating on a roughened surface, such as a roughened interior surface disclosed by Richardson, which is provided for the purpose of reducing by-product particle generation therefrom.

Moreover, Richardson discloses that the roughened surface advantageously reduces by-product particle generation from the roughened surface (col. 7, lines 43-61). Therefore,

because the roughened surface is disclosed to be sufficient to achieve Richardson's object, the Official Action provides insufficient motivation to modify Richardson's roughened surface by applying a coating to the roughened surface. Furthermore, as Richardson and Ding suggest forming a roughened exposed interior surface and an exposed coating on a covered roughened surface, respectively, for the same purpose (i.e., to increase the adhesion of particles to the roughened surface (Richardson) and coating (Ding)), the Official Action provides no motivation to modify Richardson's roughened surface by applying Ding's coating to the roughened surface.

Moreover, the asserted modification of Richardson stated in the Official Action would result in changing the principle of operation disclosed by Richardson. That is, by applying Ding's coating on Richardson's roughened interior surface, by-product particles would no longer adhere to the roughened surface, which instead would be covered by Ding's coating. The Official Action has not established that particles would adhere to Ding's coating once applied to Richardson's roughened surface. Because the basic principle of operation disclosed by Richardson would be changed by the asserted modification of Richardson's roughened surface, the Official Action has not established a *prima facie* case of obviousness. See MPEP § 2143.02, page 2100-125.[2]

[2]"If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious."

Therefore, it is respectfully submitted that Claim 14 is patentable over Richardson and Ding. Dependent Claims 15, 19, 20, 25-33, 35 and 36 are thus also patentable for at least the same reasons as those for Claim 14.

Claim 16 has been rewritten in independent form including the combinations of features of Claims 14 and 16. Claim 16, as amended, recites a component of a plasma reactor, which comprises "aluminum having an anodized or non-anodized plasma exposed surface, the component comprising an as-sprayed plasma sprayed coating on a plasma exposed surface of the component, the coating having an as-sprayed surface roughness that promotes the adhesion of polymer deposits" (emphasis added). Claim 16 is patentable over Richardson and Ding for reasons stated above with respect to Claim 14.

Claim 17 has been rewritten in independent form including the combinations of features of Claims 14 and 17. Claim 17, as amended, recites a component of a plasma reactor "made from a ceramic material selected from the group consisting of alumina, yttria, zirconia, silicon carbide, silicon nitride, boron carbide and boron nitride, the component having one or more surfaces exposed to the plasma during processing, the component comprising an as-sprayed plasma sprayed coating on a plasma exposed surface of the component, the coating having an as-sprayed surface roughness that promotes the adhesion of polymer deposits" (emphasis added). The combination of features recited in Claim 17 also is patentable over Richardson and Ding for reasons stated above with respect to Claim 14.

Independent Claim 21 recites that the component and the coating material comprise the same ceramic material. As explained at page 8, line 25 to page 9, line 5 of the

specification, using the same ceramic material can minimize or eliminate differences in the coefficient of thermal expansion, thereby reducing exfoliation.

Richardson does not suggest the formation of a coating. Ding does not suggest forming a coating of the same ceramic material as that of the component. Rather, Ding discloses that the coating preferably is of the same material as the target (col. 5, lines 51-56). Accordingly, Claim 21 is also patentable.

Claim 34, as amended, recites "a component of a plasma reactor, the component having one or more surfaces exposed to the plasma during processing, the component comprising a coating formed by a process consisting essentially of plasma spraying a coating material on a plasma exposed surface of the component that has not been roughened.... (emphasis added).

Claim 34 recites that the coating is "formed by a process consisting essentially of plasma spraying a coating material on a plasma exposed surface of the component that has not been roughened" (emphasis added). However, the asserted modification of Richardson would require a first step of roughening the surface of a component and a second step of forming a coating as disclosed by Ding on the roughened surface. The Official Action has not established that such coating formed on Richardson's roughened surface by such multiple step process would have the same features as a coating formed by plasma spraying a coating material directly on a plasma exposed surface of the component, i.e., without first roughening the plasma exposed surface. Accordingly, Richardson and Ding do not suggest a product that results from the process recited in Claim 34. Therefore, Applicants respectfully submit that Claim 34 also is patentable over Richardson and Ding.

Withdrawal of the rejection is respectfully requested.

Claim 22 was rejected under 35 U.S.C. § 103(a) over Richardson in view of Ding and further in view of U.S. Patent No. 6,120,640 to Shih et al. ("Shih"). The reasons for the rejection are stated at numbered paragraphs 37-40 of the Official Action. The rejection is respectfully traversed.

Without addressing the combination of features recited in Claim 22, Shih fails to cure the omissions of Richardson and Ding with respect to the combination of features recited in Claim 14, from which Claim 22 depends. Accordingly, the subject matter of Claim 22 also is patentable over the cited references. Withdrawal of the rejection is respectfully requested.

For the foregoing reasons, Applicants respectfully submit that the application is in condition for allowance and such action is earnestly solicited.

Respectfully submitted,

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Attachment to Amendment dated March 24, 2003

Marked-up Claims 14, 16, 17, 27 and 34

14. (Twice Amended) A component of a plasma reactor, the component being selected from the group consisting of a plasma confinement ring, a focus ring, a pedestal, a chamber wall, a chamber liner and a gas distribution plate, the component having one or more surfaces exposed to the plasma during processing, the component comprising an as-sprayed plasma sprayed coating on a plasma exposed surface of the component, [wherein] the coating [has] having an as-sprayed surface roughness that promotes the adhesion of polymer deposits.

16. (Amended) [The component of Claim 15, wherein the component comprises aluminum having an anodized or non-anodized plasma exposed surface.] A component of a plasma reactor, the component comprising aluminum having an anodized or non-anodized plasma exposed surface, the component comprising an as-sprayed plasma sprayed coating on a plasma exposed surface of the component, the coating having an as-sprayed surface roughness that promotes the adhesion of polymer deposits.

17. (Amended) [The component of Claim 15, wherein the component is made from a ceramic material selected from the group consisting of alumina, yttria, zirconia, silicon carbide, silicon nitride, boron carbide and boron nitride.] A component of a plasma reactor, the component being made from a ceramic material selected from the group consisting of alumina, yttria, zirconia, silicon carbide, silicon nitride, boron carbide and

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Marked-up Claims 14, 16, 17, 27 and 34

boron nitride, the component having one or more surfaces exposed to the plasma during processing, the component comprising an as-sprayed plasma sprayed coating on a plasma exposed surface of the component, the coating having an as-sprayed surface roughness that promotes the adhesion of polymer deposits.

27. (Amended) A method of processing a substrate in the plasma reactor of claim 26, the method comprising contacting an exposed surface of [the] a substrate with a plasma.

34. (Amended) A component of a plasma reactor, the component having one or more surfaces exposed to the plasma during processing, the component comprising a coating formed by a process consisting essentially of plasma spraying a coating material on a plasma exposed surface of the component that has not been roughened, the coating being (i) a ceramic material comprising at least one material selected from the group consisting of yttria, alumina, zirconia, silicon carbide and boron carbide or (ii) a metallic material, [wherein] the coating [has] having an as-sprayed surface roughness that promotes the adhesion of polymer deposits.